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AW	3/20/84
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FR/EN
WR ND

MAR 21 1984

MEMORANDUM

To: AWR, (Henry), Region 6
From: Regional Hydrologist, Region 6
Subject: Annual Water Use Report/Management Plan
(Tewaukon NWR)

Please extend our thanks to the Refuge Manager for the timely submission and informative documentation of refuge water use.

The narrative format used is completely adequate, but tables provided by similar stations appear to be a more concise and simpler reporting method as well as complying with attempts to standardize reports.

We have attached a copy of the Upper Souris WMP as an example for the Refuge Manager's consideration as an alternative format.

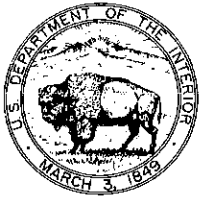
If there are any questions, please contact me or Ms. Ginger Chesy at extension 3616.

Robert C Green

Attachment :

bcc: Circ rf (2)

EN:Chesy:mk:3/20/84



United States Department of the Interior

FISH AND WILDLIFE SERVICE
TEWAUKON NATIONAL WILDLIFE REFUGE
RR #1, BOX 75
CAYUGA, NORTH DAKOTA 58013



Rec'd
Wildlife Res. JAN 24 1985

MEMORANDUM

To: WR, ND Refuge Supervisor
Denver, CO
January 22, 1985

From: Refuge Manager, Tewaukon NWR
Cayuga, ND

Subject: 1985 Annual Water Management Plan and 1984 Use Report

1. List of Water Rights

- ✓ Tewaukon NWR #1261: 7,139 acre-feet yearly (4,852 storage and 2,287 seasonal use) for Lake Tewaukon (Pool 11) and Pools 2, 3, 4, 11 and 12 dated December 1964, diversion by dams across the Wild Rice River.
- ✓ Declaration of Filing (#57) dated September 1, 1934 claimed 397 acre-feet storage and 312 acre-feet seasonal use for Clouds Lake (Pool 8) now called Hepi Lake. Listed on the same sheet as Lake Tewaukon/White Lake, as per RO(EN) Marshall Fox's 11-14-83 memo.
- ✓ Tewaukon NWR #1262: 1,130 acre-feet yearly (635 acre-feet storage and 495 acre-feet seasonal use) for Sprague Lake, dated December 1964, diversion from an unnamed creek in the SE $\frac{1}{4}$ NW $\frac{1}{4}$, Section 2.
- ✓ Tewaukon NWR #1263: 686 acre-feet yearly for Mann Lake (236 acre-feet) and Horseshoe Slough (450 acre-feet) dated December 1964, diversion from the Wild Rice River.

2. Actual Water Use - 1984

All four watersheds (Wild Rice River, Frenier Dam Outlet, Sprague Lake ditch, LaBelle Creek) flowed nicely this spring and all lakes and marshes were filled full. An initial inflow occurred in February after 1" of rain on snow and frozen ground, 2/15-16. Then a heavy inflow occurred in March when snow and rain fell 3/26-27. The only exception was that the Horseshoe Slough development filled only about 50% due to delivery system problems.

Natural wetlands filled nicely but dropped rapidly by mid summer. Being dried and cracked open for several years, the soil no doubt soaked up water greatly and caused most of this loss. Mid to late summer was quite dry and also contributed to the drop.

Excellent rains (4.14") fell 10/7-19 putting soil moisture in good shape going into freeze-up.

Lake Tewaukon (Pool 1): The Lake was frozen 3.04 feet low (out of maximum depth of 9.5 feet) at 1144.96 MSL until ice out March 26. First inflows were from LaBelle Creek on February 19. The heavy flows in March rolled down the creek over the township road, overtopped the West Parker Bay dike and cement structure and rapidly filled the Lake, 3/24. By iceout (3/26) the 1,280 acre Lake had risen 2.24 feet (1147.2 MSL).

The Lake was allowed to fill past the target depth (1148 MSL) in order to push water into four dry areas consisting of eight wetland basins. This included two deep wetlands on the Tewaukon State WMA which were dry and for which the Refuge dug a supply ditch across the WMA, with their approval, which worked "like a charm". Also a supply ditch and three "stair-step" dikes built in the past three summers finally came on line as Lake Tewaukon water was gravity flowed (at 1148.6 MSL and higher) northeast to fill three shallow wetlands (the Krause wetlands).

By 4/8 the Lake was 1.76 feet over-full (1149.76) despite five boards having been pulled. We pushed the tolerance of our downstream neighbors for field flooding and pulled seven more boards. Happily, everyone accepted the high River flows without complaint and the Lake dropped until it was stabilized at 1147.95 MSL on May 25. (Management depth is 1148.0 MSL). Early June saw more rain and the Lake increased to 1148.36 by June 22 and did not drop back to the management depth until July 14 (1147.98 MSL). The normal multiple algae blooms occurred throughout the summer. Sago production appeared to be average to slightly below average. An early freeze-up occurred November 1-2 (very early) which drove most waterfowl south. Warm temperatures and winds reopened the Lake with final freeze-up on November 27 at 1147.50 MSL, a very high fall elevation.

Parker Bay (east end of Lake Tewaukon): This was the first year of routine marsh management on this 95 acre marsh, formerly an open lake (which is a very satisfying statement to make!). From February 20-23 LaBelle Creek water was flowed in to top the pool at a maximum of about 4-1/2 feet deep. Four nesting bales were set out but no waterfowl nesting occurred. The small rock island built the winter of 1982 was accepted by cormorants and pelicans and good loafing use occurred. Duck brood and loafing use also was excellent. This fall, many large muskrat houses showed up in the Bay. Maximum water depth at freeze-up was about 32 inches.

Cutler Marsh (Pool 2): This marsh began the year very low but by late March was 100% full. It began receiving water 2/27 and began dumping water 3/31. On 4/8 it hit 1152.4 MSL, maximum for the year. Good duck and goose nesting and loafing use occurred, especially in the seldom flooded and cattail choked west end. In September, all boards were removed from two bays in the dam and the pool dewatered to facilitate next season's interior dike construction.

Pool 2A: Thanks to last year's dike and structure repair work, this 35 acre marsh held water for the first time in at least five years. It was filled to the brim from Pool 3A. But it dropped surprisingly fast so that many of the areas where the cattails were mowed off last fall revegetated with cattails. Several nice muskrat houses were present at freeze-up and maximum depth was estimated at 3-1/2 feet.

Maka Pool (Pool 3): Spring found the pool very low but it rapidly filled to a maximum of 1156.4 MSL on 4/6, which is maximum desired depth. Excellent water was backed into the vegetation choked west end. Scattered clumps of cattail were dislodged in the east end by, apparently, high water and waves. One board was pulled 7/3 and the pool lowered six inches to 1155.1 MSL and held there, 7/16. At freeze-up it was 1154.3 which was more than adequate for wildlife. Unfortunately and surprisingly very few muskrat houses appeared this fall but one large beaver lodge was built in the west center area.

Pool 3A: Held good water all year as usual.

Pool 4 (River Pool): Began the year very low - below the gauge. Good inflows occurred and water was being dumped by 2/23. It was good and full at 1160.0 MSL, 2/29. The resulting better-than-average flooding of emergent vegetation in the higher western end was well received by ducks. As in the past few years, the deeper east end received minimal use by waterfowl and a year's dewatering is being probably needed. Rains in June caused boards to be pulled as the Pool rose (1160.6 MSL on 6/30) and threatened any overwater nests present, redheads or ruddys. By early July, the upstream neighbor requested lower water so he could better work his hay fields. Two more boards were pulled and the Pool fell to 1160.2 MSL by 7/9. It declined naturally from there and froze at 1158.55 MSL in November.

Pools 5,6,7,7A: Held good water all year. The Pool 6 dike was overtopped for about a week in early April until one board was pulled from the structure. With the heavy reed canary grass cover, no damage occurred. Pool 7A is a shallow basin and precious water was lost as backflowing into Pool 8 accidentally occurred while Pool 8 was being drawn down. Most of 7A was dry by early summer, unfortunately.

Hepi Lake (Pool 8): Last year a major project was digging in 575 feet of 12 inch PVC pipe and dewatering this 108 acre lake to encourage aquatic and emergent vegetation. This was accomplished and four nesting bales were put out awaiting 1984's reflooding. Heavy inflows this spring over-filled Hepi to about six feet deep, floated the bales to shore (useless) and worried us about the survival of last year's new, little cattail and bulrush plants. Using the new drain pipe and the main (higher) outlet, this water was pulled off by the end of April and the Lake held at about three feet.

Like most newly flooded wetlands, waterfowl response was excellent. Divers and dabblers used it heavily in the spring. Duck broods were thick. Cattail and bulrush stands grew up and a few coot and ten eared grebe nests were counted. Large numbers of geese and mallards loafed there this fall. In November, we noticed the cattail and bulrush were all mowed off at the water line by, apparently, wind driven ice sheets. Hopefully the plants will not be lost.

Pool 10: This small slough received moderate runoff and provided fair habitat up to mid summer.

Pool 11 (West White Lake): Started the year dry. Excellent inflows from a small creek filled it about 95% full so fine habitat was produced. Probably due to soaking into the ground, levels dropped surprisingly fast and

the higher west end was nearly dry by late summer. In past years, this pool could not be "topped off" due to water backing onto a neighbor's field via a road culvert. The County approved and the Refuge installed a one-way type flap gate on the culvert this fall. Either spring inflows or pumping, hopefully, will top off this pool in 1985.

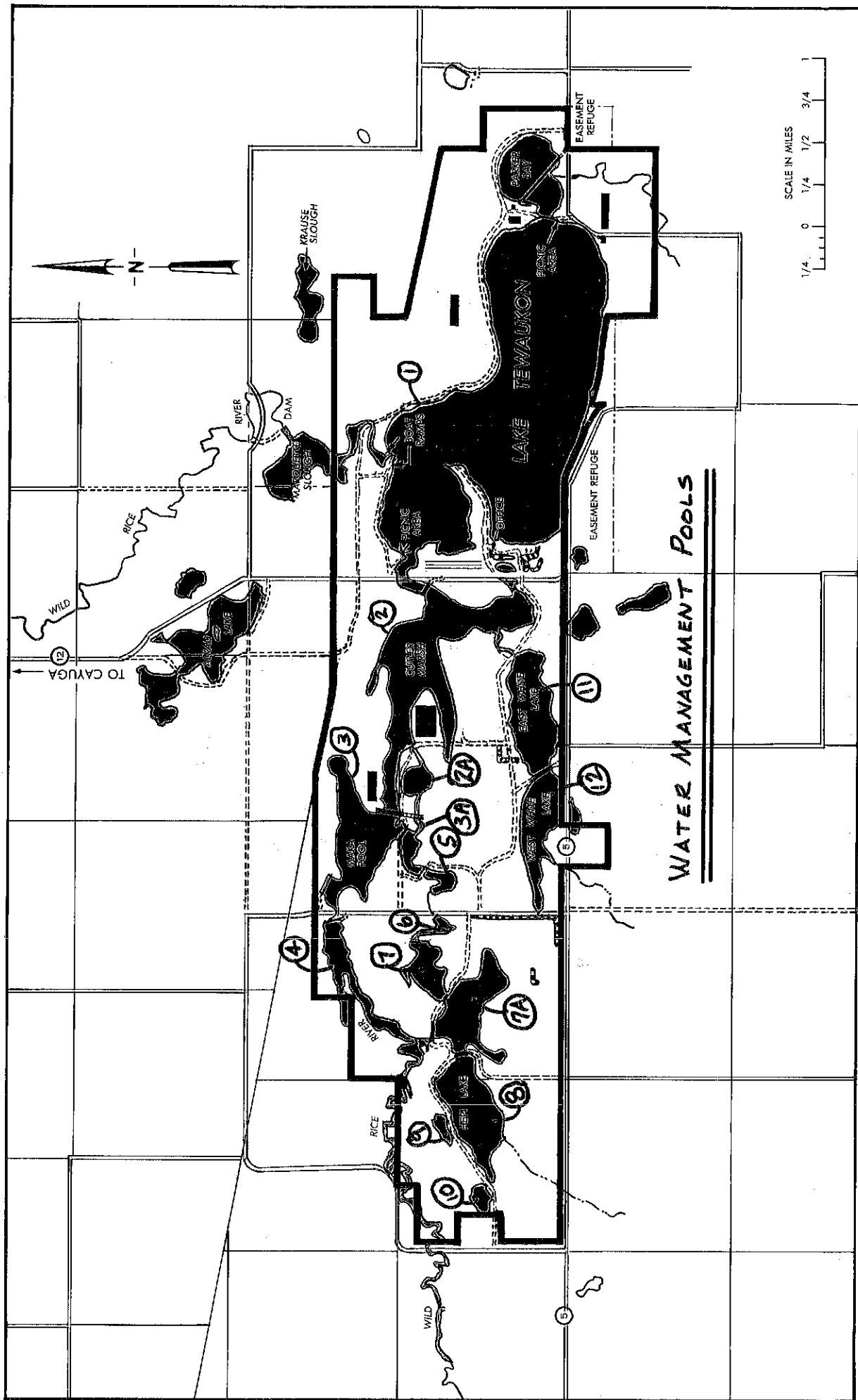
Pool 12 (East White Lake): Last year this pool was 100% dry. It was re-flooded full by 3/29 at about 4-1/2 feet maximum. Waterfowl loafing and brood use was excellent. Water levels dropped surprisingly and excessive, new cattail stands were of concern. In early July and September water was flowed in to keep the water reasonably deep to favor muskrat activity and slow the cattail increase. At freeze-up, surprisingly, only one big muskrat lodge was observed.

Pool 13 (Mann Lake): The Lake entered the year dry and the bottom in millet stubble due to last year's draw down to promote emergent vegetation. It was reflooded to a maximum of about 3-1/2 feet deep and waterfowl use exploded.

Diver use (scaup, cans and redheads) was the most spectacular but all ducks and geese were present. Muskrat burrows through the dike leaked heavily and a wash out appeared likely but did not occur. (The runs were dug out and packed closed, 4/30. The dike was widened in July). Unfortunately no emergent vegetation appeared; possibly farming the ground last year to millet was a mistake? The lake froze at about 18 inches maximum and again, will be allowed to dry up naturally in the future, if possible, so as to get cattails/bulrush established. Chris suspects Sprague Lake water subs through to supply Mann Lake so it may never dry out with Sprague Lake full.

Pool 14 (Sprague Lake): The Lake entered the year in draw down status at 17 inches maximum depth and the desired carp freeze-out occurred. Heavy inflows in March rapidly filled it to the top. By 3/27 the Wild Rice River was over it's banks and backed water into the Lake via the overflow channel. To prevent carp re-introduction Rob Hoflen put in much weekend work sandbagging closed three culverts which passed water into Sprague. The backing in water also plagued the carp barrier and flowed over it for a short time. About two weeks later, heavy inflows into the Lake from the Sisseston Hills pushed it above desired level and blew the sandbags off the three culverts since they were now on the wrong side. Again, Rob and others pitched in to drag sandbags to the other end of the culverts. With high water coming, eventually, from two directions; this spring was some learning experience on Sprague Lake water management. During the summer, test netting revealed carp back in Sprague Lake - a very disappointing development.

Pool 16 (Horseshoe Slough Group): The Wild Rice River topped it's banks just enough to start a flow into this complex of eight large wetlands (about 244 acres total) but didn't rise high enough to really push in the water. As a result, Pool A (the first Pool) was filled about 75% while the other pools remained a disappointing dry or nearly dry. During the summer, much dirt work was done to increase the gallons received under low head inflow conditions.

[illegible]

TEWAUKON NATIONAL WILDLIFE REFUGE
Pools, Elevations and Acres

<u>POOL</u>	<u>ELEVATION</u>	<u>ACRES</u>
Pool 1 - Tewaukon	1149	1015
Parker's Bay	1149	95
Pool 2 - Cutler's Marsh	1152	246
Pool 3	1156	125
Pool 4	1159	108
Pool 5	1160	10 ✓
Pool 6	1165	6 ✓
Pool 7	1178	127
Pool 8 - Hepi	1179	106
Pool 9	1167	10 ✓
Pool 10	1173	5.5 ✓
Pool 11 - W. White Lake	1151	80
Pool 12 - E. White Lake	1147	103
Pool 13 - Mann	1207	57
Pool 14 - Sprague	1209	109 186
Horseshoe Slough		244
Pool 1	1210	119.7
Pool 2	1206	42.5
Pool 3	1206	10.3
Pool 4	1206	30.3+
Pool 5	1206	24.5
Pool 6	1206	2.8+
Pool 7	1206	14.5

3. Impoundment Data

Please see the attached chart for capacities for each pool at various elevations. No formal inflow/outflow records were maintained. Please see Section #2 above for elevation changes for the various pools.

4. Descriptive Narrative - 1985 Plans

If 1985 is a dry year, the plan will be simple: hold all the water we have for maximum waterfowl production from each pool. However, if adequate runoff occurs, the following management objectives will be attempted:

Pool 1 (Lake Tewaukon): Overfill to approximately 1149-1150.0 MSL for two to five days to flow water into adjacent, dry wetlands in the Krause WPA, Tewaukon (State) WMA and Refuge. Then drop the Lake back to the maximum management depth of 1148 MSL for sport fishery habitat.

Parker Bay (east end of Lake Tewaukon): The Bay is entering it's second season of full pool management after a several year draw down cycle. It should be flooded to the maximum possible without covering the newly established cattail and bulrush stands. This should be a maximum depth of 2½-3 feet. Water should be added as needed during the summer to maintain this depth for waterfowl production and maintenance.

Pool 2 (Cutler Marsh): Allow to fill to about 1149 MSL for duck production. Starting about August 1, dewater the unit to facilitate construction of an interior cross dike.

Pool 3 (Maka Pool): Fill full (approximately 1158 MSL) and stabilize as quickly as possible before April 15 for over-water duck nesting. Feed water into Pools 2A and 3A as necessary prior to stabilizing. If approved, a fall draw down may be required to install a water control structure in the north dike preparatory to flooding the Nickeson Bottoms GDU Tract. If the draw down is not heeded, maintain maximum depth possible to favor muskrat use of the rank cattail stands.

Pool 4 (River Pool): Fill full (approximately 1162 MSL) for duck nesting, especially over-water nesting, and stabilize as quickly as possible by April 15. Continue to work with Refuge neighbor Roy Glarum to keep maximum water yet alleviate his haying problems due to wet soil conditions. Keep this pool as full as possible to promote muskrat use of the rank cattails. Review the pool for a 1986 or 1987 draw down for nutrient recycling and, secondarily, carp control.

Pools 2A, 3A, 5, 6, 7, 7A: Fill to maximum depth, if possible in order to flood out cattails. The pools will dry out rapidly through an average summer due to evaporation.

Pool 8 (Hepi Lake): An initial 4-5 foot depth may be taken to supply downstream pools 7A, 7, 6 and 5. As soon as possible draw the pool down to 3' maximum to give the new cattail-bulrush stands a good second growing year.

Pool 9: Maintain it closed off and allow it to dry out this year toward a maximum depth of three to four feet. However, it may be necessary to again overfill this pool if it is required to partially draw down Pool 8 as above.

Pool 10: Unless Pool 8 is totally flooded out (unacceptable) this unit can only be supplied by runoff. Therefore, no management.

Pool 11 (West White Lake): The west, higher end is vegetation choked. Thanks to the flap gate installed in 1984 on the south boundary road culvert, Ted Lee's field shouldn't be flooded by higher water in the future. Fill the pool as full as possible. Pumping from Pool 12 may be used. Complete pumping by May 1 to stabilize water levels, if possible.

Pool 12 (East White Lake): Flood from Pool 2 to a maximum depth of $4\frac{1}{2}$ feet to stress cattails, increase muskrats and facilitate pumping into Pool 11. Stabilize water depth by May 1 for nesting, if possible.

Pool 13 (Mann Lake): Keep closed off to facilitate a natural draw down by evaporation over the next 2-3 years to increase cattail/bulrush growth. (Due to subing from Sprague Lake, it may never go dry.)

Pool 14 (Sprague Lake): Fill to maximum pool (about 8 feet deep) for fishery use. Continue every effort to manage water through the barriers to retard the reintroduction of more carp.

Pool 16 (Horseshoe Slough): Due to rehab of the supply ditch and installation of two additional water delivery culverts and structures, make every effort to gravity flow water to flood Pool A to about 1207.5 MSL and Pools B,C,D,E,F,G to about 1206 MSL. Given a reasonable flood, the pools will fill. If necessary, pumping may be used to finally flood the six lower subpools (built in 1979 and never flooded).

There are no known problems or projects requiring hydrologic/engineering assistance beyond the on-going Dam Safety Work and the Pool 2 Interior Cross Dike. Routine maintenance and repair will be done force account on parts of the water management system as necessary during 1985.

5. Location Map

Please see Section #2 for the revised Refuge map on which all management pools are marked.


David G. Potter

Attachment